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Clinical Experience of Simultaneous Multitarget Irradiation using Tomotherapy in Pulmonary Metastasis

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Pulmonary metastasetomy is known to be able to improve the survival in selected patients with metastatic lung disease. We analyzed the short term treatment results of simultaneous multitarget irradiation using tomotherapy in the primary or secondary lung cancer patients to know whether radiation therapy could substitute pulmonary operation. We treated thirty two patients using tomotherapy for 1 year after our machine installation in 2005. The original malignancies were hepatocelluar carcinoma, lung cancer, breast cancer, colorectal cancer, invasive thymoma, thyroid cancer, pancreas cancer, endometrial cancer, renal cell carcinoma, oral cavity cancer and Ewing's sarcoma. The average number of pulmonary targets was 5.1 (range: 1-15). The unilateral pulmonary lesions were in eleven patients (34.4%) and bilateral lesions in 21 patients (65.6%). In 12 patients (37.5%), synchronous extrapulmonary targets were present. Twenty six patients (81.3%) had been treated with chemotherapy for pulmonary metastasis before tomotherapy. The median number of cycles of systemic chemotherapy was nine (range 1- 21) and the median interval between chemotherapy and tomotherapy was 2 months (range: 1-36 months). Four patients (12.5%) had a past history of mediastinal radiotherapy. We immobilized the patients with BodyFix system (Medical Intelligence, Germany) and defined the GTV (gross tumor volume) and PTV (planning target volume: GTV + 0.5 ~ 1.5cm) in chest CT scan and their median doses were 50.0±5.99 Gy and 40.0±7.03 Gy with 3-20 fractionations, respectively. Median treatment duration was 14days (range: 3-28 days). Before treatment, we always confirmed the positions of the targets and the isodose distribution after checking megavoltage CT scan. To decrease the risk of pulmonary toxicity, we tried to decrease the values of mean lung dose, median lung dose and V25 as low as possible. RECIST (Response Evaluation Criteria In Solid Tumors) method and CTCAE (Common Terminology Criteria for Adverse Event) method were used to evaluate the post-treatment response and pulmonary toxicity. The number of eligible patients was thirty (93.8%) whom we could follow up more than 1 month. Median follow up period was 6 month (1-13 months). The rates of complete and partial response were 3.3% and 46.7% in 1 month and 15.6% and 36.7% in 3 months after treatment. The overall response rate was 52.3% in 3 months after treatment. The data of pulmonary dosimetric analysis were that in right and left lung, mean lung doses were 13.89±6.70 Gy and 15.20±5.44 Gy, median lung doses were 12.52±6.27 Gy and 13.43±6.00 Gy and the values of V25 were 13.76±10.04% and 15.25±8.77%. Radiation pneumonitis or pulmonary fibrosis was appeared in 10 patients (33.3%) but all pulmonary toxicities were less than grade III. We can suggest that tomotherapy for multiple lung metastasis was a safe and effective treatment modality but we need study about further analysis of survivals, chronic complications and influencing factors through long term follow up in larger group of patients to make up the limitation of our experience.

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Diagnostic value of melanoma antigen gene in differentiation of pleural effusions

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Rationale: Pleural effusions have classically been divided into transudates and exudates. If it is exudative, more diagnostic tests are required in order to determine the cause of the local disease. Malignancy is a common and important cause of exudative pleural effusions. Because pleural fluid cytology and pleural biopsy specimens do not provide a diagnosis in a high percentage of malignant effusions, several tumor markers have been studied. To overcome this limitation, we hypothesized that measurement of melanoma antigen gene (MAGE) would be useful in differentiating between benign and malignant effusion.

Methods: We studied prospectively 127 consecutive patients with pleural effusion (malignant 42, tuberculous 27, parapneumonic 17, empyema 5, transudative 21, miscellaneous 3, nondiagnostic 12). We examined standard parameters of pleural effusion and measured the expression of MAGE and cytology with the obtained pleural effusion. Expression of MAGE was interpreted by means of a commercial kit using RT-PCR method.

Results: The sensitivity and specificity of cytology were 45.2% and 100% respectively and the positive predictive value and negative predictive value of cytology were also 100% and 76.0% respectively. The sensitivity and specificity of MAGE were 27.0% and 98.5% respectively and the positive predictive value and negative predictive value of MAGE were also 90.9% and 71.3% respectively. Using the cutoff value of 3 μg/L for CEA, the combination of MAGE and CEA in pleural fluid revealed 71.4% sensitivity and 89.0% specificity in diagnosis of malignant pleural effusion.

Conclusions: The findings of this study suggest that the combination of MAGE and CEA in addition with pleural fluid cytology would be useful as a diagnostic marker in differentiating between benign and malignant pleural effusion.

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Surgical Therapy of Malignant Pleural Mesothelioma: A Single Institution's Experience

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Introduction: Few patients with malignant pleural mesothelioma (MPM) are candidates for surgical treatment. Since it is almost impossible to achieve a R0-resection, surgery has been combined with other treatment modalities. In this retrospective study, the results of surgical therapy as part of two different therapeutic regimens were investigated.

Materials and Methods: Between 2002 and 2005, 15 MPM patients were treated with ExtraPleural Pneumonectomy (EPP/TRT) and postoperative hemi-Thoracic RadioTherapy (54 Gy). Previously (1999-2001), 20 patients underwent a combination of cytoreductive surgery - pleurectomy (12) or EPP (8) - and Hyperthermic IntraTHOracic Chemotherapy (HITHOC) with cisplatin and doxorubicin, followed by radiotherapy to the thoracotomy scar and drainage tracts (24 Gy).